



# PATENT SPECIFICATION

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## PROVISIONAL SPECIFICATION.

### Improvements in Boring-bars with Expanding Cutters.

I, CHARLES ROTHWELL, of 7, Albert Street, Milnrow, Lancashire, British nationality, do hereby declare the nature of this invention to be as follows:—  
5 This invention has for its object a boring-bar with two or more expanding cutters, in which the cutters are expanded by means of a movable piece or plunger, with tapered or chamfered ends, movable  
10 in a bore in the cutter-bar, and operated by an adjusting screw that acts on the rear end of the plunger. By this arrangement the cutters can be very conveniently adjusted, and with any required degree  
15 of delicacy.

In carrying the invention into effect, as applied, for example, to a boring-bar with four expanding cutters radially arranged at 90 degrees apart, the tool-carrying end of the bar has a central axial passage or bore drilled in it, and a second passage is drilled at right angles through the bar until it meets the rear end of the central bore. This second passage is tapped to receive the adjusting screw.

In the central bore of the bar is fitted a round plunger, preferably of hardened steel, and tapered 45 degrees at each end  
20 for expanding the cutters.

The adjusting screw, the tapered or chamfered lower end of which bears against the back end of the plunger, is also made of hardened steel, and threaded with, say 20 threads per inch. In the top of the adjusting screw is a square or other shaped hole, into which fits the correspondingly shaped bottom end of an  
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adjusting key. The top end of this key is provided with a suitable handle. A 40 collar on the shank of the adjusting key is suitably graduated, for instance, into 50 divisions. By this means the cutters can be expanded in thousandths  
45 of an inch.

The four cutters are located in inclined passages which enter the central bore, and are secured by grub-screws which screw through passages situated at right angles to the cutters. The cutters are 50 tapered 60 degrees at their inner end to allow them to come together to a point, and upon such end of the cutters the forward tapered end of the plunger acts. By turning the adjusting screw, therefore, by means of the key, the cutters 55 can be expanded to the desired extent, and are then secured in their adjusted position by tightening up the grub-screws. A mark is made on the body of the boring-bar for use in setting with the adjusting key.  
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The axial bore in the boring bar is closed at its forward end by a grub-screw to keep out dirt.

The opposite end of the boring bar is 65 can be provided with either an internal or external thread to suit machine spindles, or left blank to suit turrets, or can be turned with a Morse taper.

Dated this 30th day of November, 1922.

W. P. THOMPSON & Co.,  
12, Church Street, Liverpool,  
Chartered & Registered Patent  
Agents.

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## COMPLETE SPECIFICATION.

### Improvements in Boring-bars with Expanding Cutters.

I, CHARLES ROTHWELL, of 7, Albert Street, Milnrow, Lancashire, British nationality, do hereby declare the nature of this invention and in what manner  
80 the same is to be performed, to be parti-

[Price 1/-]

cularly described and ascertained in and by the following statement:—

This invention relates to improvements in boring-bars with one or more expanding cutters of the type in which the 80

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cutters are expanded by means of a movable piece or plunger, with tapered or chamfered ends, movable in an axial bore in the cutter-bar, and operated by 5 an adjusting-screw working in a passage at right angles to the axial bore and having a bevelled end that acts on the rear end of the plunger.

The improved arrangement of boring-bar according to this invention comprises, in combination, an axial bore in the tool-carrying end of the bar, cutters with a tapered inner end located in inclined passages communicating with 15 the axial bore, a movable piece in said bore having tapered or chamfered ends and the front end of which bears against the inner end of the cutters and an adjusting-screw located in a passage at 20 right angles to the axial bore and having a tapered inner end adapted to act on the rear end of the movable piece when the screw is turned by an operating key that sockets in the top of the adjusting- 25 screw.

The invention will be further described with reference to the accompanying drawing, in which:

Figure 1 is a sectional side elevation 30 of the tool-carrying end of a boring-bar made in accordance with my invention.

Figure 2 a plan.

Figure 3 a front elevation.

Figures 4 and 5 a side elevation and 35 plan respectively of a key for turning the adjusting-screw.

In carrying the invention into effect, as applied, for example, to a boring-bar 1 with four expanding cutters 2 radially 40 arranged at 90 degrees apart, the tool-carrying end of the bar has a central axial passage or bore 3 drilled in it, and a second passage 4 is drilled at right angles through the bar until it meets 45 the rear end of the central bore 3. This second passage 4 is tapped to receive the adjusting screw 5.

In the central bore 3 of the bar is fitted a round plunger 6, preferably of hardened 50 steel, and tapered 45 degrees at each end for expanding the cutters 2.

The adjusting-screw 5, the tapered or chamfered lower end of which bears 55 against the back end of the plunger, is also made of hardened steel, and threaded with, say 20 threads per inch. In the top of the adjusting-screw is a square or other shaped hole 7, into which fits the correspondingly-shaped bottom 60 end 8<sup>a</sup> of an adjusting key 8 illustrated in Figs. 4 and 5. The top end of this key is provided with a suitable handle. A collar 8<sup>b</sup> on the shank of the adjusting

key is suitably graduated, for instance, into 50 divisions. By this means the cutters can be expanded in thousandths of an inch.

The four cutters 2 are located in inclined passages which enter the central bore 3 and are secured by grub-screws 10 which screw through the passages 9, which are situated at right angles to the cutters 2. The cutters are tapered 60 degrees at their inner end 2<sup>a</sup> to allow them to come together to a point, and upon such end of the cutters the forward tapered end of the plunger 6 acts. By turning the adjusting-screw 5, therefore, by means of the key 8, the cutters 2 can be expanded to the desired extent, and are then secured in their adjusted position by tightening up the grub-screws 10. A mark is made on the body of the boring-bar for use in setting with the adjusting key.

The axial bore 3 in the boring-bar 1 is closed at its forward end by a grub-screw 11 to keep out dirt.

The opposite end of the boring-bar can be provided with either an internal or external thread to suit machine spindles, or left blank to suit turrets, or can be turned with a Morse taper.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. In a boring-bar with expanding cutters of the type specified, the arrangement for expanding the cutters, comprising, in combination, an axial bore in the tool-carrying end of the bar, cutters with a tapered inner end located in inclined passages communicating with the axial bore, a movable piece in said bore having tapered or chamfered ends and the front end of which bears against the inner end of the cutters, and an adjusting-screw located in a passage at right angles to the axial bore and having a tapered inner end adapted to act on the rear end of the movable piece or plunger when the screw is turned by an operating key that sockets in the top of the adjusting screw, substantially as described.

2. A boring-bar with expanding cutters, constructed, arranged and operating substantially as hereinbefore described and shown in the annexed drawing.

Dated this 31st day of August, 1923.

W. P. THOMPSON & Co.,  
12, Church Street, Liverpool,  
Chartered & Registered Patent Agents. 125

*[This Drawing is a reproduction of the Original on a reduced scale]*

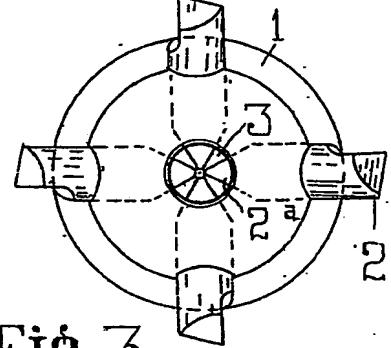
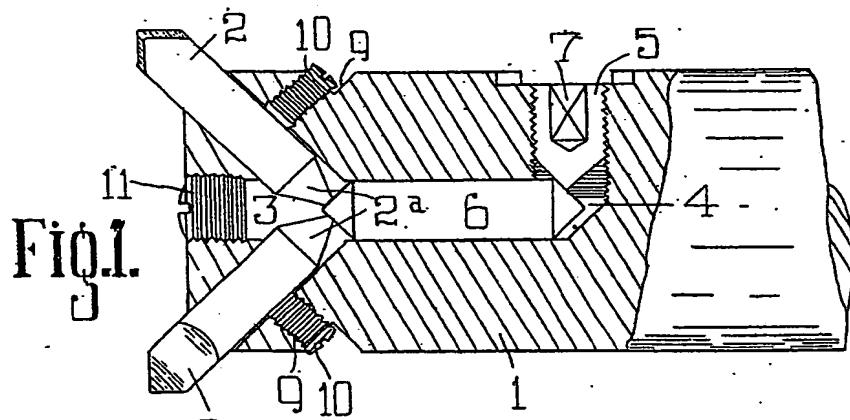


Fig. 3.

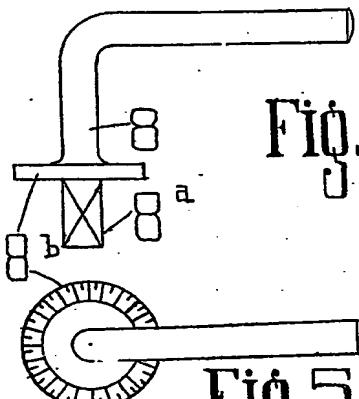


Fig. 4.  
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